Second Report of the Video Programming Accessibility Advisory Committee on the Twenty-First Century Communications and Video Accessibility Act of 2010

User Interfaces, and Video Programming Guides and Menus

April 9, 2012

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I. INTRODUCTION/OVERVIEW

Introduction and Legislative Background

On October 8, 2010, President Obama signed the Twenty-First Century Communications and Video Accessibility Act of 2010 ("CVAA" or "the Act"), which amended certain sections the Communications Act of 1934 relating to communications access and video programming.[1] The purpose of the bill was "to update the communications laws to help ensure that individuals with disabilities are able to fully utilize communications services and equipment and better access video programming."[2] Among its provisions was the establishment of an advisory committee known as the Video Programming and Emergency Access Advisory Committee (later known as "VPAAC").[3] The Chairman of the Federal Communications Commission ("Commission" or "FCC") was charged with appointing members to the VPAAC that included representatives from a wide range of organizations and other entities with an interest in the delivery of video

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[1] See generally PL 111-260, as amended by PL-265 (Oct. 8, 2010).

[2] See S.R. 111-386 (Dec. 22, 2010), at 1. See also H.R. 111-563 (July 26, 2010), at 19.

[3] See CVAA § 201(e) (1). In order to avoid confusion with the Emergency Access Advisory Committee, the Commission changed the name of the advisory committee to the Video Programming Access Advisory Committee, or VPAAC. See Video Programming Accessibility Advisory Committee By-Laws ("VPAAC By-Laws"), at 1.

programming via the Internet who have the technical knowledge and engineering expertise to fulfill the VPAAC's duties.[4]

Formation of VPAAC Working Group 4

On December 10, 2010, the Chairman appointed the members of the VPAAC.[5] Subsequently, the FCC announced the appointment of the VPAAC co-chairs and members of the Commission staff to assist the VPAAC. At the first meeting of the VPAAC in Washington, D.C. on January 13, 2011, the FCC co-chairs of the VPAAC divided the members into four advisory working groups to assist the VPAAC.[6]

Working Group 4 was created to examine issues involved in ensuring the accessibility of user interfaces and video programming guides and menus utilized for the navigation, discovery, and selection of video programming to end-users with disabilities.

The leadership of Working Group 4 consisted of Susan Kimmel, FCC Policy Co-Chair; Alison Neplokh, FCC Technical Co-Chair; Jeff Newdeck (Motorola Mobility), Industry Co-Chair; and Brian Charlson (American Council of the Blind), Public Interest Co-Chair.

II. WORKING GROUP 4 CHARTER, OBJECTIVES, & GUIDELINES OVERVIEW

Charter and Objectives

The charter of Working Group 4 was to develop recommendations for the provision of accessible user interfaces on video programming devices, including recommendations for the standards, protocols, and procedures used to:

A. "Enable the functions of apparatus designed to receive or display video programming transmitted simultaneously with sound (including apparatus designed to receive or display video programming transmitted by means of services using Internet protocol) to be accessible to and usable by individuals with disabilities."

B. "Enable on-screen text menus and other visual indicators used to access the functions on an apparatus described in subparagraph (F) to be accompanied by

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[4] The statute specified that the VPAAC should include "(1) Representatives of distributors and providers of video programming or a national organization representing such distributors. (2) Representatives of vendors, developers, and manufacturers of systems, facilities, equipment, and capabilities for the provision of video programming delivered using Internet protocol or a national organization representing such vendors, developers, or manufacturers. (3) Representatives of manufacturers of consumer electronics or information technology equipment or a national organization representing such manufacturers. (4) Representatives of video programming producers or a national organization representing such producers. (5) Representatives of national organizations representing accessibility advocates, including individuals with disabilities and the elderly. (6) Representatives of the broadcast television industry or a national organization representing such industry. (7) Other individuals with technical and engineering expertise, as the Chairman deems appropriate." See CVAA § 201(b).

[5] FCC Public Notice, *Video Programming and Emergency Access Advisory Committee Announcement of Members*, DA-2320, 25 FCC Rcd. 17094 (released Dec. 7, 2010 and erratum released Jan. 7, 2011).

[6] See VPAAC By-Laws, at 1.

audio output so that such menus or indicators are accessible to and usable by individuals with disabilities."

C. "Enable video programming information and selection provided by means of a navigation device, guide, or menu to be accessible in real-time by individuals who are blind or visually impaired."

Given this charter, the VPAAC defined functional requirements to enable access to user interfaces, apparatus functions, on-screen text menus, and video programming guides and menus provided on apparatus designed to receive or display video programming transmitted simultaneously with sound.

To define these functional requirements, the following approach was taken:

1. Define the set of essential functions of apparatus designed to access video programming transmitted simultaneously with sound.

2. Define the challenges that users with visual or auditory disabilities face in accessing and utilizing these functions.

3. Define functional requirements that such apparatus should meet in order to address the challenges that disabled users face and ensure that these essential functions are accessible to and usable by such users.

In accordance with CVAA requirements that the FCC not mandate specific technical standards, the functional requirements recommended by the VPAAC are intentionally abstracted from specific device types, implementations, and/or technologies currently available or currently foreseen. The intent was to define the baseline of functionality required to ensure accessibility without constraining innovation and product differentiation, thereby allowing the consumer marketplace to identify the optimal technologies and implementations. Where applicable example implementations utilizing currently available and/or potentially near-term technical solutions are included as illustrative examples, they are only meant to clarify the intent of the associated functional requirement.

Guidelines

The most directly applicable sections of the CVAA that served to guide these activities are Section 204 and Section 205.

Section 204 of the CVAA, User Interfaces on Digital Apparatus, requires:

1. "if achievable[7] that digital apparatus designed to receive or play back video programming transmitted in digital format simultaneously with sound, including apparatus designed to receive or display video programming transmitted in digital format using Internet protocol, be designed, developed, and fabricated so that control of appropriate built-in apparatus functions is accessible to and usable by individuals who are blind or visually impaired, except that the Commission may not specify the technical standards, protocols, procedures, and other technical requirements for meeting this requirement;"

2. "that if on-screen text menus or other visual indicators built in to the digital apparatus are used to access the functions of the apparatus described in paragraph (1), such functions shall be accompanied by audio output that is either integrated or peripheral to the apparatus, so that such menus or indicators are accessible to and usable by individuals who are blind or visually impaired in real-time;"

3. "that for such apparatus equipped with the functions described in paragraphs (1) and (2) built in access to those closed captioning and video description features through a mechanism that is reasonably comparable to a button, key, or icon designated for activating the closed captioning or accessibility features; and"

4. "that in applying this subsection the term 'apparatus' does not include a navigation device, as such term is defined in section 76.1200 of the Commission's rules (47 CFR 76.1200)."

    a. Section 76.1200 of the Commission's rules defines the term "navigation device" as "devices such as converter boxes, interactive communications equipment and other equipment used by consumers to access multichannel video programming and other services offered over multi-channel video programming services."

Section 204 also stipulates:

1. Implementing Regulations – Within 18 months after the submission to the Commission of the Advisory Committee report required by section 201(e)(2), the Commission shall prescribe such regulations as are necessary to implement the amendments made by subsection (a).

2. Alternate Means of Compliance- An entity may meet the requirements of section 303(aa) of the Communications Act of 1934 through alternate means than those prescribed by regulations pursuant to subsection (b) if the requirements of those sections are met, as determined by the Commission.

3. Deferral of Compliance with ATSC Mobile DTV Standard A/153- A digital apparatus designed and manufactured to receive or play back the Advanced Television Systems Committee's Mobile DTV Standards A/153 shall not be

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[7] For purposes of its work the VPAAC adopted the definition of achievable as defined in Section 716 of the CVAA: "...with reasonable effort or expense, as determined by the Commission" based on four factors: (1) the nature and cost of the steps needed to meet the requirements of this section with respect to the specific equipment or service in question; (2) the technical and economic impact on the operation of the manufacturer or provider and on the operation of the specific equipment or service in question, including on the development and deployment of new communications technologies; (3) the type of operations of the manufacturer or provider; and (4) the extent to which the service provider or manufacturer in question offers accessible services or equipment containing varying degrees of functionality and features, and [those services or equipment are] offered at differing price points.

required to meet the requirements of the regulations prescribed under subsection (b) for a period of not less than 24 months after the date on which the final regulations are published in the Federal Register.

Section 205, Access to Video Programming Guides and Menus Provided on Navigation Devices, requires:

1. "if achievable[8] (as defined in section 716), that the on-screen text menus and guides provided by navigation devices (as such term is defined in section 76.1200 of title 47, Code of Federal Regulations) for the display or selection of multichannel video programming are audibly accessible in real-time upon request by individuals who are blind or visually impaired, except that the Commission may not specify the technical standards, protocols, procedures, and other technical requirements for meeting this requirement;"

2. "for navigation devices with built-in closed captioning capability, that access to that capability through a mechanism is reasonably comparable to a button, key, or icon designated for activating the closed captioning, or accessibility features; and"

3. "that, with respect to navigation device features and functions—

    a. delivered in software, the requirements set forth in this subsection shall apply to the manufacturer of such software; and

    b. delivered in hardware, the requirements set forth in this subsection shall apply to the manufacturer of such hardware."

Section 205 also stipulates:

1. Implementing Regulations:

    a. IN GENERAL – Within 18 months after the submission to the Commission of the Advisory Committee report required by section 201(e)(2), the Commission shall prescribe such regulations as are necessary to implement the amendment made by subsection (a).

    b. EXEMPTION – Such regulations may provide an exemption from the regulations for cable systems serving 20,000 or fewer subscribers.

    c. RESPONSIBILITY – An entity shall only be responsible for compliance with the requirements added by this section with respect to navigation devices that it provides to a requesting blind or visually impaired individual.

    d. SEPARATE EQUIPMENT OR SOFTWARE

        i. IN GENERAL – Such regulations shall permit but not require the entity providing the navigation device to the requesting blind or

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[8] *Id.*

visually impaired individual to comply with section 303(bb)(1) of the Communications Act of 1934 through that entity's use of software, a peripheral device, specialized consumer premises equipment, a network-based service or other solution, and shall provide the maximum flexibility to select the manner of compliance.

ii. REQUIREMENTS – If an entity complies with section 303(bb)(1) of the Communications Act of 1934 under subparagraph (A), the entity providing the navigation device to the requesting blind or visually impaired individual shall provide any such software, peripheral device, equipment, service, or solution at no additional charge and within a reasonable time to such individual and shall ensure that such software, device, equipment, service, or solution provides the access required by such regulations.

e. USER CONTROLS FOR CLOSED CAPTIONING – Such regulations shall permit the entity providing the navigation device maximum flexibility in the selection of means for compliance with section 303(bb)(2) of the Communications Act of 1934 (as added by subsection (a) of this section).

f. PHASE-IN:

i. IN GENERAL - The Commission shall provide affected entities with:

1. not less than 2 years after the adoption of such regulations to begin placing in service devices that comply with the requirements of section 303(bb)(2) of the Communications Act of 1934 (as added by subsection (a) of this section); and

2. not less than 3 years after the adoption of such regulations to begin placing in service devices that comply with the requirements of section 303(bb)(1) of the Communications Act of 1934 (as added by subsection (a) of this section).

3. APPLICATION- Such regulations shall apply only to devices manufactured or imported on or after the respective effective dates established in subparagraph (A).

III. GLOSSARY

For disabled users to fully understand and use accessibility functions and services, readily recognizable and consistent terminology and icons should be considered. Below are definitions for terms used in this report.

"A/V Content," or Audio / Video Content, refers to video programming transmitted simultaneously with sound.

"Closed Captioning" (or "CC") is widely understood as a service whereby the audio portion of a video program is displayed as text and is the term that will be used in this report.

"Essential functions," as used in this report, refers to the set of appropriate built-in apparatus functions, see CVAA §204(a)(aa)(1).

"Focus," as used in the context of user interfaces, refers to the component of the user interface which is currently selected to receive input. Text entered at the keyboard or pasted from a clipboard is sent to the component which currently has the focus. It may require a button press to activate the component. Moving the focus away from a specific user interface element is known as a blur event in relation to this element.

In terms of accessibility, focus can specify a number of things. For text-to-speech audio, the screen reader can have focus on a specific area of the screen which is the portion for which speech will be generated from the text. However, in many instances, for the screen reader function, the text may be selected but it cannot be modified or edited. For example, the user can have the screen focus on a dialog box only, frame, application window if more than one is open, or the entire screen. When reviewing text or menu options, the screen reader can define focus to be on a line or word/words.

"Tactile," as the term is used in this report, is defined simply as "perceptible by touch."

"Verbosity" is the term used to specify the amount of spoken text performed by a screen-reader. It also may be used to select the amount of punctuation signs spoken aloud. In addition, the verbosity settings may have the capability to announce font size, color of text, presence of dialog box, background color of dialog box, etc. Most of all, verbosity parameters can control the text-to-speech output to enable a user to hear all that appears on the screen or to select only certain pieces of information, such as screen changes. For navigation purposes, the user may want to hear only the text that is in focus as the user scrolls up or down a menu. For example, when the user presses a menu key and the menu appears, the user may choose to hear the options as they are in focus or choose to hear additional instructions, such as how to use the up and down arrows to make selections. When the term verbosity is used to control input, the user may prefer a limited mode because the user is sufficiently familiar with the product that he or she will not want to hear every key being pressed. In other cases, such as for a person with age related visual impairment, the user may want to hear the function of each button as it is pressed in order to validate that the button they selected was the correct one.

"Video description" is the term used in the CVAA to identify a narrative audio service (audio describing the action in the video program) and is the term that will be used in this report.

IV. ESSENTIAL USER INTERFACE FUNCTIONS

The CVAA stipulates that the VPAAC provide recommendations to "enable the functions of apparatus designed to receive or display video programming transmitted simultaneously with sound...to be accessible to and usable by individuals with disabilities."

However, the CVAA does not define the set of intended functions that must be made accessible and usable by individuals with disabilities. Therefore, the first task undertaken was to define the set of functions considered essential to the video consumption experience. The essential functions as defined are applicable to devices covered under CVAA Section 204 and CVAA Section 205.

The essential functions are:

1. Power On / Off

2. Volume Adjust and Mute

3. Channel / Program Selection

4. Display Channel / Program Information

5. Configuration – Setup

6. Configuration – CC Control

7. Configuration – CC Options

8. Configuration – Video Description Control

9. Display Configuration Info

10. Playback Functions

11. Input Selection

V. USER NEEDS & FUNCTIONAL REQUIREMENTS

In this section, we expand on the definition of these essential functions and look at the user needs of those who are blind or vision impaired and those who are deaf or hard of hearing with respect to these functions. These needs are relevant to the CVAA's requirements for user interfaces on digital apparatus (CVAA Section. 204) and access to video programming guides and menus provided on certain navigation devices (CVAA Section. 205).

The user needs related to these functions and the challenges that blind or vision impaired and/or deaf or hard of hearing users encounter in accessing these functions were identified. Then these needs were mapped to baseline functional requirements. Attempts to ensure an equivalence of experience wherever possible between users without visual or auditory disabilities and users who are blind or vision impaired and/or deaf or hard of hearing were made. Each essential feature and function of a device/application that can be performed visually should be able to be performed non-visually.

To support the user needs of blind or visually impaired individuals, Section 204 of the CVAA describes accessibility requirements regarding on-screen text, menus or other visual indicators, stating that audible output must be provided (either integral to the device or via a connected peripheral device). For the program guide and channel selection functions in

set-top boxes, Section 205 of the CVAA requires that the "display or selection of multi-channel video programming are audibly accessible in real-time upon request by individuals who are blind or visually impaired."

Section 205 also distinguishes between requirements related to hardware and those related to software. Set-top boxes can provide the capability to decode and display A/V content through a combination of hardware, resident firmware, and/or software. Such functionality is natively included in these devices.

In contrast, consumer devices covered by Section 204 may have no native capability to decode and display A/V content, but with a suitable downloaded application, such capability may be enabled. Perhaps the most common example of this approach is video playback capability enabled via a web browser equipped with suitable video decoder "plug-ins" downloaded by the user.

Technical mechanisms to meet the user needs identified herein are not specified in this report, as it is impossible to predict how innovation and the advance of technology will open up new ways of using devices; however, some illustrative examples based on current technology are provided in a subsequent section. Again, these examples are intended *only as illustrations* to clarify the intent of the associated functional requirements and are not to be construed as solutions that are endorsed by the VPAAC.

User Needs

All users have common needs with respect to interaction with devices that render or playback video. Typically interactions with such devices involve the following:

1. **User Input** – This includes the need for users to be able to locate, identify, and interact with the control mechanism for each essential function of the device or application in order to express their intent, for control of playback operations, setting preferences, making selections of content of interest, and the like. Input mechanisms should be readily accessible to users with visual and/or auditory disabilities.

2. **User Feedback** –For a user with a disability, feedback that does not depend on the impaired ability is essential for effective interaction with a device. Appropriate user feedback methods should be provided to users with visual and/or auditory disabilities.

Functional Requirements to Ensure Accessibility of Essential Functions

Operation of the essential functions may vary from device to device. In order to address the needs of all users, each function should be made readily accessible. For a blind or vision impaired person, identifying the location of the Control mechanism for each essential function and reliably recognizing that the desired result is realized is a challenge and requires special support including for example tactile and/or acoustic feedback. For a deaf or hard of hearing person, tactile and/or visual feedback is useful in confirming the desired result has been achieved.

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Note that there is an open Access Board Proceeding that is proposing updated guidelines for closed caption and video description controls. The VPAAC encourages the FCC to harmonize requirements related to closed caption and video description controls with the new Access Board guidelines to ensure there are no conflicting requirements related to these functions.[9]

1. POWER ON/OFF:

Devices may be equipped with a power on/off function allowing the user to turn them on and off.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

2. VOLUME ADJUST AND MUTE

Some devices provide mechanisms to adjust and mute or un-mute the volume.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

  o Note that the change of volume level is generally considered a sufficient non-visual feedback mechanism for Volume Adjust and Mute functions.

3. CHANNEL / PROGRAM SELECTION

Some devices provide a channel / program selection function. An example is a device that offers simple physical numeric and/or channel up and channel down buttons. Other examples include more complex channel / program selection methods relying on on-screen guides or menus that allow a user to browse a library of available A/V content for selection. Note that on-screen guides and menus used to browse available A/V content can take many different forms and the user input and feedback mechanisms can be quite different depending on the specific implementation.

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[9] Information and Communication Technology (ICT) Standards and Guidelines, *Advance Notice of Proposed Rulemaking*, December 2011. *See* http://www.access-board.gov/sec508/refresh/draft-rule.pdf

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

    o Note that Section 204 of the CVAA requires that "if on-screen text menus or other visual indicators built in to the digital apparatus are used to access the functions of the apparatus...such functions shall be accompanied by audio output that is either integrated or peripheral to the apparatus, so that such menus or indicators are accessible to and usable by individuals who are blind or visually impaired in real-time."

    o Note that Section 205 of the CVAA requires that " if achievable, that the on-screen text menus and guides provided by navigation devices for the display or selection of multichannel video programming are audibly accessible in real-time upon request by individuals who are blind or visually impaired."

4. DISPLAY CHANNEL / PROGRAM INFORMATION

Devices might provide a function to display channel or program information. Examples of this function include mechanisms to access both high level channel or program descriptions, such as a channel's "call-sign" identifier or a specific program's title, as well as more detailed channel or program information such as plot descriptions, actors, accessibility options (e.g. presence of CC or video description), etc. The control of these functions can vary widely from device to device but generally rely heavily on visual feedback, limiting their accessibility and usability for blind and vision impaired users.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

    o Note that Section 204 of the CVAA requires that "if on-screen text menus or other visual indicators built in to the digital apparatus are used to access the functions of the apparatus...such functions shall be accompanied by audio output that is either integrated or peripheral to the apparatus, so that such menus or indicators are accessible to and usable by individuals who are blind or visually impaired in real-time."

    o Note that Section 205 of the CVAA requires that " if achievable, that the on-screen text menus and guides provided by navigation devices for the display or selection of multichannel video programming are audibly

accessible in real-time upon request by individuals who are blind or visually impaired."

5. CONFIGURATION – SETUP

Some devices may provide a set of configuration or setup functions. Examples include configuration of video display and audio settings, selection of preferred language for on-screen guides or menus, etc.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

  o Note that Section 204 of the CVAA requires that "if on-screen text menus or other visual indicators built in to the digital apparatus are used to access the functions of the apparatus…such functions shall be accompanied by audio output that is either integrated or peripheral to the apparatus, so that such menus or indicators are accessible to and usable by individuals who are blind or visually impaired in real-time."

  o Note that Section 205 of the CVAA requires that "if achievable, the on-screen text menus and guides provided by navigation devices for the display or selection of multichannel video programming are audibly accessible in real-time upon request by individuals who are blind or visually impaired."

6. CONFIGURATION – CC CONTROL

Devices should provide a closed caption (CC) Control function to enable or disable the display of closed captioning.

Apparatus should ensure that CC controls are persistent, whereby a user's caption-related selections are maintained across application launches, re-boots, power cycles, etc. When a setting is persistent, that setting should remain until a user causes it to be changed or the apparatus is reset to factory default settings. Depending on the device in question, these Controls should be applicable to a specific device or a user profile that spans multiple devices.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

  o Note that according to Sections 204 and 205 of the CVAA, access to the closed caption Control function must be offered via a "mechanism

that is reasonably comparable to a button, key, or icon designated by activating the closed captioning or accessibility features."[10]

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

7. CONFIGURATION – CC OPTIONS

Devices should provide a CC Options function to support the capability for the user to modify the display of closed caption data. Examples of such capabilities include configuration of the font size, font color, background color, opacity, etc.

Devices designed to receive or play back video programming transmitted simultaneously with sound are required to provide as CC Options the full range of technical capabilities listed under 47 C.F.R. 79.103(c) (see Closed Captioning of Internet Protocol-Delivered Video Programming: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010, Report and Order, FCC 12-9 (Rel. Jan 13, 2012)).

Apparatus should ensure that CC Options are persistent, whereby a user's caption-related selections are maintained across application launches, re-boots, power cycles, etc. When a setting is persistent, that setting should remain until a user causes it to be changed or the apparatus is reset to factory default settings. Depending on the device in question, these options should be applicable to a specific device or a user profile that spans multiple devices.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

8. CONFIGURATION – VIDEO DESCRIPTION CONTROL

Devices should provide a video description Control function to enable or disable the output of video description audio services.

Apparatus should ensure that video description settings are persistent, whereby a user's video description selections are maintained across application launches, re-boots, power cycles, etc. Video description settings are persistent until a user causes it to be changed or the apparatus is reset to factory default settings. Depending on the device in question, these settings should be applicable to a specific device or a user profile that spans multiple devices.

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[10] See the discussion related to the phrase "reasonably comparable" in the Open Issues section of this report for dissenting views on how the Commission should define this critical term.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

  o Note that according to Section 204 of the CVAA, access to the video description function must be offered via a "mechanism that is reasonably comparable to a button, key, or icon designated by activating the closed captioning or accessibility features."[11]

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

9. DISPLAY CONFIGURATION INFORMATION

Devices might provide a Display Configuration Information function to inform the user how the user preferences are currently configured.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

10. PLAYBACK FUNCTIONS

Some devices provide media playback functions, such as Pause, Play, Rewind, Fast Forward, Stop and Record.

- <u>User Input Functional Requirement</u> – A readily identifiable Control mechanism must be made available to support these functions that can be located both visually and non-visually.

- <u>User Feedback Functional Requirement</u> – A readily accessible feedback mechanism must be made available to support these functions that can be received both visually and non-visually.

11. INPUT SELECT

Devices that support the capability to display A/V content received from one of multiple sources might provide an Input Select function to allow the user to select their preferred input source.

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[11] See the discussion related to the phrase "reasonably comparable" in the Open Issues section of this report for dissenting views on how the Commission should define this critical term.

- User Input Functional Requirement – A readily identifiable Control mechanism must be made available to support this function that can be located both visually and non-visually.

- User Feedback Functional Requirement – A readily accessible feedback mechanism must be made available to support this function that can be received both visually and non-visually.

VI. SCHEDULE OF DEADLINES

A. Devices Covered Under Section 204

The VPAAC recommends that industry be given not less than two years after publication of user interface regulations in the Federal Register to comply with the regulations, following the precedent the Commission set with the Advanced Communications Services and Closed Captioning rules.

B. Devices Covered Under Section 205

The VPAAC recommends devices covered under Section 205 be required to comply with Section 205 regulations under the "Phase-In" schedule described in the CVAA (CVAA, §205(b)(6)). Consistent with the Schedule of Deadlines recommendation for Section 204, the phase-in periods should be measured from the date of publication of the regulations in the Federal Register.

VII. ILLUSTRATIVE EXAMPLES

As discussed in the user needs section of the VPAAC report, a blind or visually impaired or deaf or hard of hearing user must be able to control the accessibility features of a device. The VPAAC provides the following examples for information and context. These examples are meant to illustrate several strategies by which device features can be made accessible. The examples listed here are not meant to be interpreted as the only acceptable ways of enabling or controlling accessibility. Instead, they are meant to illustrate multiple innovative methods already present for enabling and using accessibility options. The VPAAC does not necessarily recommend or endorse any of these examples. Innovation in meeting user needs is encouraged; taking advantage of the creativity of product designers and the advancing capabilities of new devices as technology inevitably evolves.

1. If a physical button is used for the Control mechanism, the button should be easily identifiable either through its location, shape, or feel. For example, the button could be spaced a distance away from other buttons and/or use a unique shape (rounded edges vs straight, for example) or tactile marking such as a raised dots, arrows, etc. to identify it.

2. For devices that rely primarily on touch-screen controls for an essential function(s), easily identifiable icon placement and/or unique finger gestures could be used to control the essential function(s).

3. As mentioned, it is essential that the feedback mechanism for each essential function be accessible visually and/or non-visually. In order to provide useful non-visual feedback informing the user of the result of their input, it is critical that the feedback be unique for different results such that the user is able to discern which of the various possible results of their action was achieved. This could be achieved via unique audio

feedback such as an ascending tone for power on vs a descending tone for power down, or unique tactile feedback such as a long vibration for power on vs. short vibration for power off, for example.

4. If audible feedback (e.g., text-to-speech) is provided, it may not be usable if the audible portion of the TV programming drowns out the sound of the audible feedback. Examples of possible ways this interference could be addressed might include:

    i. Configuring the device to mute or decrease the audio while audible feedback is being provided, then return the volume to normal;

    ii. Streaming the audible feedback to a device (e.g., phone, headset) held to the ear or worn in the ear so the audible feedback can be heard above the sound coming from the video device;

    iii. Streaming the audible feedback to a separate tactile device (e.g., a phone with a vibration mode).

5. Closed Caption and Video Description activation might be accessed through a button, key, icon, gesture, voice command, etc. They might be accessed directly through a dedicated control or a control that can be configured; included in a suite of accessibility options that can be configured and then accessed as a group; triggered automatically through recognition of a registered user known to the device; or many other possible mechanisms.

6. Many possible ways exist for making textual information that may be necessary for controlling an apparatus accessible to individuals who are blind or visually impaired. Examples might include:

    i. Text-to-speech (which is most useful when it is adjustable with respect to parameters such as speech rate, pitch, tone, and verbosity).

    ii. Text magnification (which is most useful when it is adjustable)

    iii. Color contrast (which is most useful when it is adjustable)

7. The usability of the accessibility configuration mechanism might be enhanced by grouping a user's accessibility preferences together and making it possible to activate these preferences as a group. The settings within a grouping might be customized for an individual as a user profile. Pre-programmed themes might be provided such as "Blind," "Deaf," "Low Vision," "Low Hearing," "Limited Mobility/Dexterity," etc. A further enhancement might be the capability to store multiple user profiles so that in a home where there are individuals with different accessibility needs, they could switch between configuration profiles.

8. When menus are used to present options including configuration settings and content selections, some devices use a combination of arrow keys and a select key to navigate up, down, left and right through available options and "Select" to indicate the desired option. On some devices, these keys may be activated through the press of buttons while some others are activated through touch gestures on a screen. Some of these device

menus "speak" the options including not only the item that has the focus, but the row and column headers when necessary to understand the meaning of the item with the focus. They also might provide a method for repeating and even spelling aloud the item with the focus.

9. When a device is required to access recorded or buffered A/V content, some devices place their controls in a horizontal line similar to a tape player and/or give unique shapes such as arrows to indicate the purpose of each control. These controls may have their purpose "spoken" or they can indicate their purpose by the use of ascending and descending tones to indicate the direction of playback, rewind or fast-forward, others play the audio track aloud while moving and/or give a sound bite of the current location alone or along with either a digital counter or progress bar.

10. When a device offers access to a number of content options, some devices use arrow-shaped buttons to indicate up and down a list of choices while others might use a touch screen and ask the user to slide a finger on a touch screen up to the previous list item or down to the next item or quickly navigate to items listed in alphabetical order with an item picker control. Many also offer numeric keypads, either physical buttons or on-screen touch controls to quickly select an item by number. Many of these devices "speak" the item as the user navigates through the list and calls on the user to give a second command to select the item. Other devices may use web applications allowing channels to be changed remotely from a browser or network connection to the device.

11. Because many devices access content from a number of inputs, some devices use arrow-shaped buttons to indicate moving left and right through a list of inputs or use a single uniquely located multi-press control to perform the same function. Alternatively, some devices use touch screen finger gestures or web applications controlled remotely via browser or network connections to move through the inputs. Some of these devices "speak" the inputs as the user navigates through them and calls on the user to do a second command to select the desired input. As an example, on a TV with multiple inputs it is useful for the user to be able to identify that their set-top is on input 1, their DVD player is on input 2, their gaming console is on input 3, etc.

12. To overcome the challenges for blind or vision-impaired users to identify the location of the input Control mechanism for an essential function and reliably recognize that the desired result is realized, a user guide which is accessible non-visually could be made available which clearly outlines the location of the Control mechanisms for each essential function and the feedback mechanism that the user should expect when using them.

13. In some devices the captions are only activated when the "mute" button is on. In addition, on some devices when volume is increased, captions disappear. Such devices fail to accommodate people who have a significant hearing loss but who have enough residual hearing to benefit when both the audio and the captions are provided simultaneously. Without access to both audio and captions, their ability to understand the program is significantly diminished. Devices that control the volume control and mute functions independently from the captioning function provide a more accessible and usable solution for deaf or hard of hearing users.

14. Often it is impossible to determine the accessibility of a program (whether it provides captioning or video description) until after watching a set of previews and/or advertisements. This can lead to frustration on the part of users dependent on such capabilities as they attempt to locate programming that meets their accessibility needs. A more accessible and usable solution for deaf or hard of hearing and blind or vision impaired users would provide clear identification of the accessibility options that are available for a program prior to viewing, such as labeling the program as having captions and/or video description within the mechanism used to display channel / program information.

VIII. RECOMMENDATIONS

1. With respect to the use of tactile and/or visual markings to identify the input Control mechanisms for particular essential functions, the VPAAC recommends that industry work to standardize such markings to ensure commonality throughout the market of covered devices, minimizing the variance that blind or vision-impaired users would encounter.

2. We note that there is varied terminology in the marketplace that is used to refer to the narrative audio service referred to as "video description" in the CVAA and within this report. In Europe and other regions the English language term for this narrative audio service is "audio description". Furthermore, an "AD" logo is used to help identify the service by content creators, providers, programmers, and device manufacturers. Users in the United States need similar, consistent and readily understandable terminology (and preferably a logo or standardized graphical symbol) to easily identify the narrative audio service. One possibility is to adopt the same terminology and logo as used in Europe. Doing so would ensure the needs of users in the United States are met and would help device manufacturers and service providers to provide consistent and easy access to the narrative audio service without undue expense by potentially re-using products sold into other markets. It is also noted that the identifier "VD" (for video description) carries negative connotations and is problematic for use in commercial products.

3. The VPAAC notes that there are several terms used to describe services whereby audio portions of a video program are displayed as text, and that these services are often confused. "Closed Captioning" (or "CC") is widely used in the United States and a logo identifying availability of the service is in widespread and relatively consistent use. On the other hand, "Subtitling", is used to present a text version of dialog in a second language within the video. (For example, English language movies may provide textual dialogue in French or Spanish.) Additionally, in Europe and other regions, the term "subtitle" is often used to indicate a service similar to Closed Captioning where visual indicators are presented with the video to help understand the dialogue. Thirdly, some packaged media such as DVD and Blu-Ray provide a service called "Subtitles for the Deaf and Hard of Hearing" (SDH). Because users may encounter three different but related terms describing textual dialogue services, the VPAAC recommends that all content creators, providers, programmers, and device manufacturers adopt the term "Closed Captioning." NOTE: packaged media may include Subtitles and/or SDH services and also (separately) closed captioning. The SDH service may not offer the same level of user control over presentation (color, size, etc.) as does the closed captioning service.

4. The VPAAC also recommends that the Control mechanism for closed caption should be identified by a universal symbol, wherever practical[12], that is available in the public domain such that all hardware and software manufacturers have free and open access to utilize the symbol.

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[12] See the discussion related to the use of "wherever practical" in the Open Issues section of this report.

APPENDIX A.   OPEN ISSUES

1. "Reasonably Comparable" – There was much discussion regarding the definition of "reasonably comparable" as it relates to the requirements defined in CVAA Section 204(aa)(2) and CVAA Section 205(bb)(2).

Specifically, the following text was proposed for inclusion in this report by consumer representatives:

> "When dedicated physical buttons are used to control volume and/or channel selection, the controls for access to closed captions (or video description) must also be dedicated physical buttons, comparable in location to those provided for control of volume or channel selection."

Consumer representatives believe that this text best accomplishes the purpose of the accessibility language in Section 205.

However, NCTA and other industry representatives felt this language was more prescriptive than what the CVAA intended, and could result in constraining the opportunities to innovate in this area. "The express language of the CVAA provides 'maximum flexibility' to entities providing navigation devices to comply with the user control provisions of Section 205. The Act further makes clear that access to captioning capability must be "reasonably comparable to a button, key or icon" designated for activating that feature. Thus, NCTA proposed language intended to preserve MVPDs' flexibility to innovate and to devise solutions to accessing features on navigation devices consistent with the language and intent of Section 205 of the CVAA."[13]

Likewise, the language of the CVAA provides the same 'maximum flexibility' to entities providing digital apparatus to comply with the user Control provisions of Section 204. CEA agrees with NCTA's proposed language to preserve manufacturer's flexibility to innovate and devise solutions to accessing features on digital apparatus consistent with the language and intent of Section 204 of the CVAA.

The alternative text proposed by NCTA (and endorsed by CEA and its member companies) is as follows:

> "When dedicated physical buttons are used to control volume and/or channel selection, the controls for access to closed captions (or video description) must also be reasonably comparable to physical buttons, comparable in accessibility to those provided for control of volume or channel selection."

Consumer representatives were concerned that this language was too broad however, and consensus could not be reached on this point.

The following is intended to provide an alternative view with regards to the intent of the term "reasonably comparable" in the CVAA from the consumer advocate perspective:

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[13] Comments provided by NCTA

"The CVAA's language concerning 'reasonably comparable' controls for captioning and description were written at the request of consumers who persuaded Congress that existing mechanisms deployed in the marketplace for controlling captioning and description features are inadequate. Specifically, the legislative record is replete with consumer complaints that existing captioning and description controls are extraordinarily difficult to locate because they are buried deep within non-intuitive on-screen menu structures which, particularly in the case of video description, require vision. The purpose of the 'reasonably comparable' provision is to remediate this problem by balancing the need for readily identifiable controls with broader design concerns with regard to physical and virtual controls for all device functions. To give the 'reasonably comparable' provision meaning, the first question to consider is what the captioning and description control for a given device should be compared to. For example, if a device relies exclusively on physical controls and does not present the user with on-screen menus at all, it is clearly beyond the intent of the CVAA for an on-screen menu Control to be used to actuate captioning or description. The same principle operates for a device relying exclusively on virtual controls. But when, as is the case with most devices, the user is presented with a mix of both physical and virtual controls, designers need to apply the "reasonably comparable" provision in a way that aligns captioning and description controls with whatever readily identifiable physical or virtual controls may otherwise be available to actuate functions that do not require the user to hunt for them in a maze of menu choices. The fact that the comparison between the captioning and description controls with other controls must be "reasonable" simply means that practical, commonly understood approaches to captioning and description controls must be adopted that answer the intent of Congress to improve the status quo which leaves consumers guessing about how and where to access captioning and description. The "reasonably comparable" provision can be read to require that both the captioning function and the description function must each be stand-alone controls, i.e., a button, a key, or an icon designated for the purpose. If a button, key or icon is used not as a primary level control but simply directs the user to yet another array of controls or menu options which in turn present an array of choices, congressional intent to improve the status quo is not met. We would expect anything that would qualify as "reasonably comparable" to be as easy to locate as a channel control; as easy to select as an on/off control and have as straight forward feedback as a volume control. Without all three of these attributes, ease of location, ease of use and intuitive feedback, any device covered by the CVAA fails to meet the intent of the law."[14]

2. "Wherever Practical" – There were dissenting opinions regarding the inclusion of the caveat "wherever practical" in the recommended use of a universal "Closed Caption" symbol. Industry representatives were concerned that the symbol that will be used may not fit within the bounds of all physical buttons and/or may not be supportable by all user interfaces. Consumers were concerned that the phrase "wherever practical" is too vague, open ended, and allows for inconsistent identification of the button that controls closed captions.

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[14] Comments provided by the Carroll Center for the Blind

APPENDIX B.   SUGGESTED ADDITIONAL READING

1. CEA-CEB21: *Recommended Practice for Selection and Presentation of DTV Audio*
2. CEA-2041: *Standard for a Round Tactile Feedback Feature*
3. Access Board: Information and Communication Technology (ICT) Standards and Guidelines, *Advance Notice of Proposed Rulemaking*, December 2011. For the text go to: http://www.access-board.gov/sec508/refresh/draft-rule.pdf. For more information from the Access Board with links to the preamble, etc.: http://www.access-board.gov/508.htm. For analysis and comparisons with WCAG and TEITAC: http://508-255-refresh.trace.wisc.edu/content/learn-more